

# ANNALS OF SURGERY.

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## THE OPERATIVE TREATMENT OF THE HYPERTROPHIED PROSTATE.<sup>1</sup>

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IN THE short space which I have allowed myself for the presentation of this subject, there is not room for an exhaustive consideration of this topic, and much that is appropriate to its discussion is of necessity omitted. It has been thought better to concentrate the field of this investigation mainly upon the establishment of definite underlying principles and an exposition of the reasons therefor.

### ENUMERATION OF METHODS.

The operations that have been performed for the relief of the hypertrophied prostate are *Palliative and Radical*.

The *palliative* consist in draining the bladder through the perineum or from above the symphysis pubis, namely:

1. Perineal urethrotomy or cystotomy.
2. Suprapubic puncture with retained cannula.
3. Suprapubic cystotomy with retained drainage tube.

The *radical* imply the division of or the removal of a part or the whole of the median enlargement or a lateral obstructing portion. To this end we have:

<sup>1</sup>Read before the Association of American Genito-Urinary Surgeons, Washington, D. C., September 19, 1888.

1. Division of the median obstruction by suitable burning or cutting instruments, passed from the meatus—urethral prostatotomy, (Guthrie, Civiale, Mercier, Teevan, Gouley, Bottini, etc.)

2. The removal of the whole or a part of the median obstruction by similar means, or by the ecraseur—urethral prostatectomy, (LeRoy d'Etiolles, Mercier, Gouley, etc.)

3. The same ends accomplished through a perineal section of the urethra, perineal prostatotomy and perineal prostatectomy, (Gouley, Harrison, Belfield, Keyes, Annandale, Cabot, etc.)

4. Tunnelling the median enlargement and subsequent drainage, (Harrison.)

5. The removal of a part or the whole of the obstructing prostatic portions through a supra-pubic cystotomy—supra-pubic prostatectomy. (Dittel, Billroth, McGill, Atkinson, Belfield, etc.)

The methods of iodine injections into the substance of the gland (Heine,) of electrical superficial cauterization, (Newman,) of electrolysis by electrodes inserted into the gland (Biedert, Caspar, etc.,) will not be considered here, for while they may in the future be so developed as to be of value, their results are as yet too uncertain to require serious discussion.

#### INDICATIONS FOR OPERATION.

This investigation does not apply to the majority of all persons affected with prostatic hypertrophy. They do well under the palliative forms of treatment. But only to that minority of sufferers from aggravated forms of the malady—such, for example, as have the following symptoms:

Inability to urinate spontaneously, frequent attacks of retention (*especially when they are not within reach of skilful catheterization*), difficult, very frequent (once an hour) or painful catheterization, impossibility of catheterization—a purulent or hemorrhagic cystitis, *and failure of palliative treatment* (bladder washes, medicaments, hygiene.)

For such or similar grades of the disease I wish to establish

once for all the claim of the *necessity* of surgical interference. How needful such a claim is may be judged by the status of

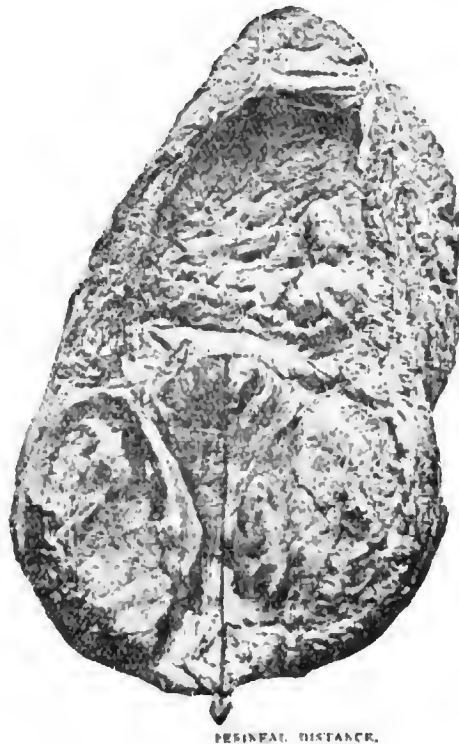


FIG. 1—SPECIMEN OF BILATERAL AND MEDIAN PROSTATIC ENLARGEMENT.

Three-fourths actual size. *Class 1.*

1. Perineal distance  $2\frac{1}{4}$  inches.
2. A bladder of small capacity and non-distensible.
3. The median portion but slightly enlarged, approaching the form of a bar between the lateral lobes.

A case in which Mercier's or Bottini's operation could have been employed, but the median enlargement being within reach from the perineum, and central division being all that is needed, it is well suited to perineal prostatotomy; while there is, moreover, not only no demand here for the suprapubic method, but on the contrary, the contracted rigid walled bladder of small capacity constitutes a contra-indication to its performance.

surgical opinion of to-day in regard to the matter, which may be learned from the following quotations :



FIG. 2.—SPECIMEN OF BILATERAL AND MEDIAN PROSTATIC ENLARGEMENT.

Three-fourths actual size. *Class. I*

1. Perineal distance  $2\frac{3}{4}$  inches.
2. The median enlargement is here greater than in Fig. 1 and more salient.
3. A large bladder, and distensible.

Bottini's and Mercier's operations difficult of performance in such a case. The median growth is within reach from the perineum. Its larger size than in the foregoing specimen, however, calls for more than central division. The removal of a V-

Professor Guyon remarks that if we examine the specimens of hypertrophied prostates, furnished by autopsies, it is extremely rare to find one of such a form, that any benefit could have been derived by any plan of incision or excision, and in 1887 he entirely condemned all radical operations upon such cases.

Socin takes the same ground.

Sir Henry Thompson (in the *British Medical Journal*, Nov. 17, 1887,) reports a case of suprapubic cystotomy with retained cannula for relief of prostatic obstruction in a patient aged 64, who derived great benefit from this procedure and advocates this treatment in similar cases. In the same meeting at which this occurred there are also reported by Mr. McGill three cases of suprapubic prostatectomy in elderly people, all of whom made a rapid recovery, were restored from a suffering and dangerous condition to health—and two of them at any rate regained the power of voluntary urination. After which Sir Henry is reported as saying that in cases of long standing prostatic hypertrophy he did not believe that the removal of the growth would be of any permanent benefit.

In the discussion following, Mr. Heath encouraged the plan of operation as practiced by Mr. McGill in his cases, viz. the suprapubic one.

Mr. Barwell advocated a more extended trial of the same method.

Mr. Bryant thought it an open question whether it was better to attack these cases by the perineal or the suprapubic route.

Mr. McGill said that the supra pubic route was by far the better one.

In 1887 Landerer reported a case of perineal prostatectomy and advocated *that* method of treatment.

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or U-shaped piece would answer better. Perineal prostatectomy is here the operation of choice—although the suprapubic route is here possible owing to the large capacity of the bladder. If this had been done, however, in this case, the presence of a diverticulum with very thin walls which may be seen at the fundus of the bladder would have doubtless caused an intra-peritoneal rupture of the viscus. This condition could not, of course, have been foreseen. In the prostatic urethra are two false passages, due to bad catheterization, causing the patient's death. *Bad catheterization is the most dangerous of all operations in these cases.*

Mr. Reginald Harrison believes in operations in suitable cases either by tunnelling the median enlargement from the perineum or dividing or removing it from the same point or from above the symphysis pubis, but gives no reasons governing the choice of operations.

Teevan and Gouley advocate Mercier's operation—though preferring to approach the obstructions from the perineum.

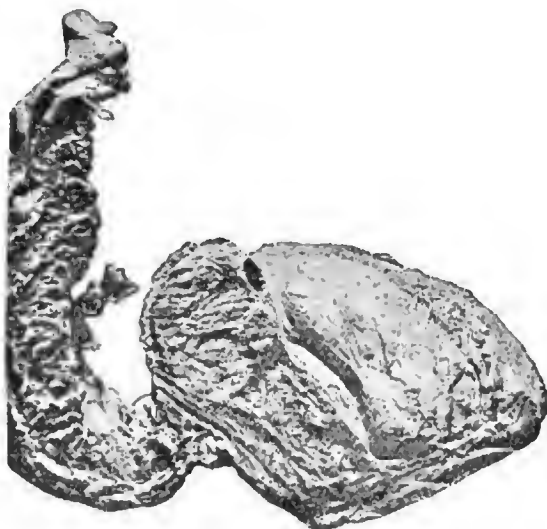


FIG. 3.—A PROFILE VIEW OF FIG. 2.

This incidentally shows the deep *bas fond* behind the prostate; in this case, it was occupied by fifty-nine fragments of some pure uric acid stones that had undergone spontaneous fracture. The patient was not aware that he had stone and indeed had no urinary symptoms until ten days before his death.

Bottini advocates his operation with the galvano-cautery from the meatus.

Dittel and Billroth favor supra-pubic prostatectomy in some extreme cases,—though the former is also an advocate for supra-pubic puncture with retained canula, in spite of the fact that a majority of nearly one hundred cases in which he employed it died soon afterwards.

Dr. Belfield, of Chicago, in an interesting article on fifteen cases of bladder exploration condemns the operations of Mer-

cier and Bottini, and states that the supra-pubic is greatly superior to the perineal method of operation. And so might be quoted others to the same effect.

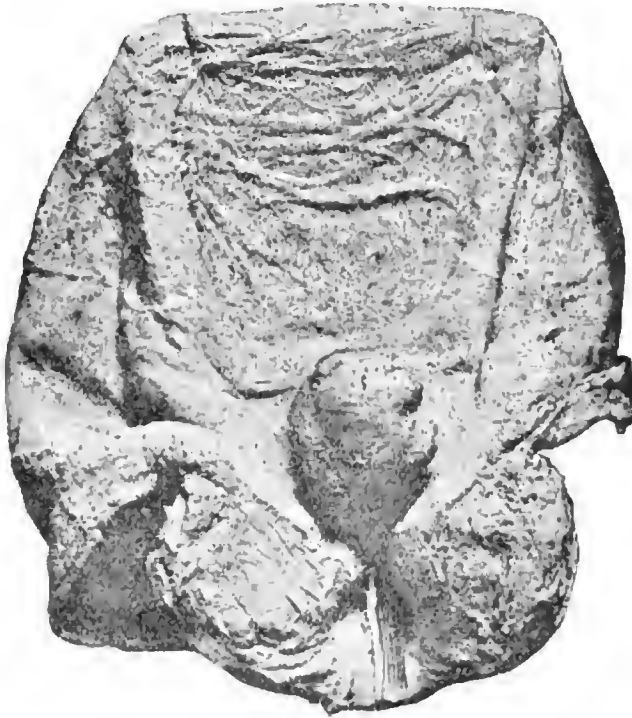


FIG. 4.—SPECIMEN OF BILATERAL AND MEDIAN PROSTATIC ENLARGEMENT.

Three-fourths actual size. *Class 1.*

1. Perineal distance  $2\frac{1}{2}$  inches.
2. Median enlargement salient and broadly pedunculated.
3. Thin walled, distensible bladder of large capacity.

Median enlargement within reach from the perineum, but the growth is too large and salient to make its central division effectual in removing the obstruction, and also makes it difficult to apply instruments even from the perineum to remove a part or the whole of it.

On the other hand the great bladder capacity renders the suprapubic operation very easy, and it consequently becomes decidedly the method of choice in such a case.

Now my intention in delaying to make these quotations is

to bring out conspicuously the fact, that firstly, the best surgi-



FIG. 5.—SPECIMEN OF BILATERAL AND MEDIAN PROSTATIC ENLARGEMENT.  
Three-fourths actual size. *Class I.*

1. Perineal distance  $2\frac{3}{4}$  inches
2. Large salient broadly pedunculated median enlargement.
3. A bladder of large capacity.

This specimen represents a still greater degree of median enlargement than the preceding ones, and the same conclusions as to choice of method are true to even a greater degree than in the last instance. The suprapubic route is here decidedly that of choice.

cal opinion is at variance as to the propriety of any radical measures in these cases. (Guyon, Sir Henry Thompson, Socin



in the negative), and secondly, that from amongst those who do advocate them, no one has told us why one method is better than another, whether one method is applicable to all cases, and if not!—why not! In other words, no *rationale* underlies the operative treatment.

It is the chief object of this communication to show that the opinions of those on the negative side of the question, (condemning operative measures) are not in accordance with the evidence at our disposal, and furthermore, to lay down the rationale of the operative treatment with the definite



FIG. 6.—A PROFILE OF THE LAST SPECIMEN. SHOWING MORE ACCURATELY THE FORM OF THE MEDIAN ENLARGEMENT, AND THAT IT IS WELL SUITED TO ECRASEMENT BY THE SUPRAPUBIC ROUTE.

reasons therefor, in the hope that it may serve as a ground for future surgical action.

To do this I have to offer data of two sorts: 1, anatomical and 2, clinical.

The anatomical collection consists of thirty specimens furnished by autopsies. This series agrees, in the main, with respect to the relative frequency of the enlargement of the different prostatic portions with the well known collections of Sir Henry Thompson and Dittel. It may consequently be taken as a type of all cases of the disease, and inferences drawn

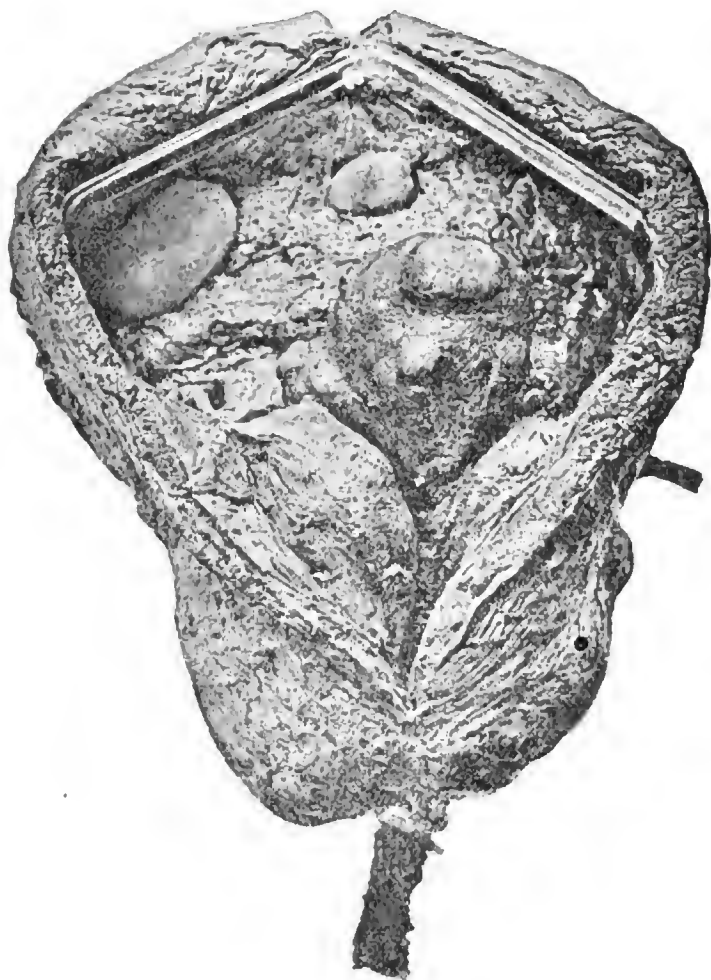


FIG. 7.—SPECIMEN OF BILATERAL AND MEDIAN PROSTATIC ENLARGEMENT.

Three-fourths actual size. *Class I.*

1. Perineal distance, 4 inches.
2. A median enlargement of great size broadly pedunculated.
3. A bladder of large capacity.

This represents one of the furthest developments of the median enlargement. The long perineal distance and the great size, and the salient form of the growth make the suprapubic method imperative here, while the capacity of the bladder allows of its performance. The suprapubic operation is the only one by which such a growth could have been approached with any hope of success. This specimen ends *Class I.* The specimens have been arranged to show a progressive development of the median enlargement from a very moderate to a great size.

from its study are applicable to any conditions liable to be encountered.

In looking at the plates of these specimens which are here reproduced three-fourths of the actual size from photographs of the object, there are three essential points to keep constantly in mind as being the determining factors in the choice of operation, anatomically speaking. These are: i. *The distance from the junction of the prostatic and membranous urethra to the most distant point of the median enlargement within the bladder. This distance I shall for the sake of convenience call the perineal distance.*

Its importance lies in the fact that upon its length depends the possibility or impossibility of reaching efficiently with the finger from the perineum the obstructing portion and working upon it.

*If it is not more than three inches* the median enlargement (which, as we shall see, is almost invariably the offending member) is within working reach of most surgeons' index finger passed through an external perineal urethrotomy. If longer it will require an exceptionally long finger to reach it. This limit is, therefore, selected as the most generally applicable.

2. *The form of the median enlargement.*

This is important too, for (a) only when it approaches the form of a bar at the neck of the bladder, or between the two lateral lobes, or is but slightly differentiated into the so-called "third" lobe can it be successfully attacked by either Mercier's or Bottini's operations. (b) If very salient or pedunculated, division centrally alone, even if within reach from the perineum, will not be sufficient, and removal of part or whole most difficult, owing to the cramped space offered by the perineal route so that such cases are better approached by the supra-pubic route, and the possibility of doing this latter with its modern technique, (distending the bladder and elevating it by rectal ballonement) depends upon *whether bladder is of small capacity and non distensible, or on the contrary, of large capacity and distensible.* In what way these three determining anatomical factors harmonize with the clinical experience will be seen later.

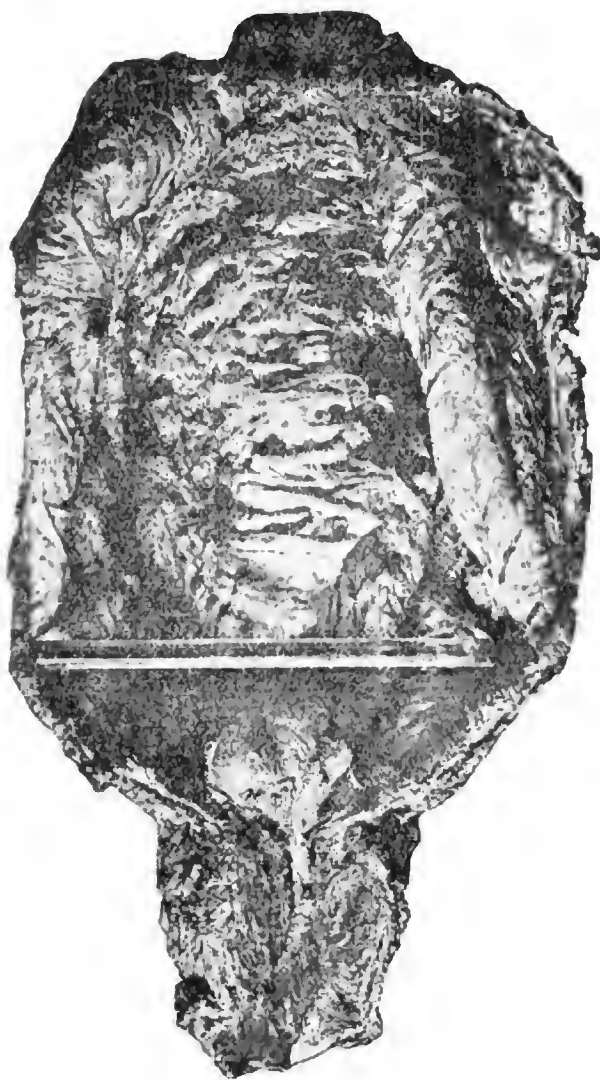


FIG. 8.—SPECIMEN OF MEDIAN PROSTATIC ENLARGEMENT.

Three-fourths actual size. *Class 2.*

Median enlargement only. This class furnishes those cases best adapted to the perineal operations, owing to the short perineal distance due to the absence of

The specimens are divided into five separate classes which represent practically all the varieties of form in which the disease occurs.

Class 1.—Contains specimens of bilateral and median enlargement; fourteen examples.

Class 2.—Median enlargement only; nine examples.

Class 3. Bilateral enlargement only; four examples.

Class 4.—Median and unilateral enlargement; two examples.

Class 5.—Separate pedunculated tumors; one example.<sup>1</sup>

To return to the anatomical specimens—what their study has shown us is this. That contrary to the statement of Prof. Guyon, the large majority of cases *do* present such forms as to render radical operations possible and often easy.

In almost every instance (28 out of 30 cases) the median growth constituted the *chief* obstacle to urination. In ten cases, it proved its *only* obstacle. Consequently in the great majority of cases a successful attack upon this portion will yield the desired result.

Further, in twenty-one of the thirty specimens, (more than two-thirds of all) the median enlargement was within reach from the perineum and that in ten, or nearly one-third of the cases, the small capacity of the bladder and the rigidity of its walls made the supra-pubic operation (with its modern technique, always understood) impossible.

<sup>1</sup>Neither the etiology, the secondary effects, nor the microscopic pathology of the hypertrophied prostate are to be here discussed. It is desired to concentrate the attention on its operative treatment. I have made, therefore, no reference to the inter-ureteral bar, the construction of the bladder floor, trabeculation etc.

As many of the specimens are for all practical purposes repetitions I shall only present a few of them as typical examples, drawing conclusions, however, from the whole number. Any one who may be interested in studying the entire collection where the exact conditions are shown is referred to the author's monograph on the subject. (Cupples and Hurd, Boylston Street, Boston.)

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lateral hypertrophy, which determines, as a rule, its greater length when present, as we have just seen in Class 1.

1. Perineal distance,  $2\frac{1}{2}$  inches.

2. A median enlargement of moderate size broadly pedunculated.

3. A bladder of large capacity.

A case easily reached and treated by perineal prostatotomy or prostatectomy.



FIG. 9. SPECIMEN OF MERIDIAN PROSTATIC ENLARGEMENT.

From a plaster cast. Three-fourths actual size. *Class 2.*

1. Perineal distance,  $3\frac{1}{2}$  inches.
2. A large median growth, about the size and shape of the unimpregnated uterus.
3. A bladder of large capacity.

On the other hand, in seven cases the great perineal distance made the low operation impossible.

In those instances, while in a few more the salient or pedunculated form of the growth, even though it was within reach from the perineum, made its removal in the cramped space offered by that route so difficult that the supra-pubic method became in these also the more desirable one.

In other words, the anatomical forms and conditions of this disease are such, that no one method is adequate for or applicable to all the varieties to be encountered, and that contrary to what would be inferred from the authors quoted previously in this article and others, *we do not have our choice of a variety of procedures, but are urged to one or another in any given case, according to the conditions encountered in that case, and in obedience to the definite reasons in connection with it first laid down.*

#### CLINICAL DATA.

It remains to sift the clinical evidence.

This has been found unusually difficult for the reason that the reports of cases are so meagre and incomplete in their essential details. We learn, for instance, that Mercier performed his operation upon upwards of four hundred patients, but out of this number there are only the fifteen (those subjected to examination by a scientific jury), of whom there is at all a satisfactory account, and we have to rest content with the surgeon's statement that he was never satisfied with the results. Such generalities cannot, of course, be embodied in a statistical reckoning. Again, the same is true of nearly one hundred cases of suprapubic puncture done by Dittel. In only a few of the cases are we told of the clinical details. The professor says that he, too, is much pleased with the results of the ope-

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The great perineal distance is here due to the size of the median enlargement alone, an unusual condition. Owing to its length and to the form of the growth, the perineal operations are here out of the question, and the suprapubic, rendered possible by the large bladder, is that of choice.

This is a case in which rectal examination would have probably entirely failed to give an accurate idea of the extent and form of the growth.

ration, but adds that the majority of the cases died shortly after its performance.

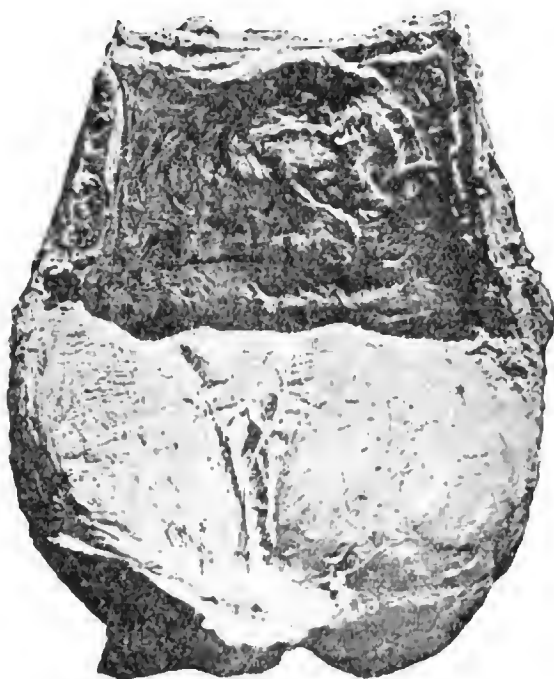


FIG. 10. SPECIMEN OF BILATERAL PROSTATIC ENLARGEMENT WITH CONNECTING BAR BETWEEN THE LATERAL LOBES.

Three-fourths actual size. *Class 3.*

1. Perineal distance  $2\frac{3}{4}$  inches.
2. Bar between the lateral lobes, the form of median obstruction.
3. Contracted and rigid walled bladder of very small capacity.

Median enlargement within reach from the perineum. Central division of the median obstruction is all that is needed. Perineal prostatotomy the operation of choice. The suprapubic method impossible owing to contracted and small bladder.

As a result of an examination of the comparatively small number of detailed reports coming from reliable sources, to which I have confined myself, we have of—



## PALLIATIVE OPERATIONS.

	Cases.	Deaths.
1. Suprapubic puncture with retained cannula, - -	12	9
2. Suprapubic cystotomy with retained cannula, - - -	5	2
3. Median perineal urethrotomy, drainage, - -	8	1
	—	—
	25	12

Mortality—48 per cent.

## RADICAL OPERATIONS.

	Cases	Deaths.
1. Prostatotomy from meatus, - - - - -	11	2
2. Prostatotomy from perineum, - - - - -	10	1
3. Prostatectomy from meatus, - - - - -	4	1
4. Prostatectomy from perineum, - - - - -	12	1
5. Supra-pubic prostatectomy, - - - - -	11	3
	—	—
	48	8

Mortality—17 per cent.

## PERMANENCY OF RESULTS AND BENEFITS.

*Palliative Operations.*—1. Suprapubic cystotomy and permanent drainage—3 cases under observation for one year; all were restored to health and comfort.

2. Perineal drainage—3 cases under observation more than one year; restored to health and comfort.

*Radical Operations.*—1. Urethral prostatotomy—5 cases under observation for two years; well until then, when in three of them symptoms of urinary obstruction returned; five cases more, observed for six months, during which time they remained entirely free from urinary symptoms.

2. Perineal prostatotomy—4 cases under observation for two years, free from urinary symptoms during this time; general health restored; two cases were observed for six months; entirely well during that time.

3. Perineal prostatectomy—one case observed for more than one year; relief of all urinary symptoms.

4. Three cases of suprapubic prostatectomy, observed for eight months; restoration of general health, of bladder function, and relief of all urinary symptoms.

Of nineteen palliative operations six were known to have been entirely relieved for at any rate one year. Of forty-three

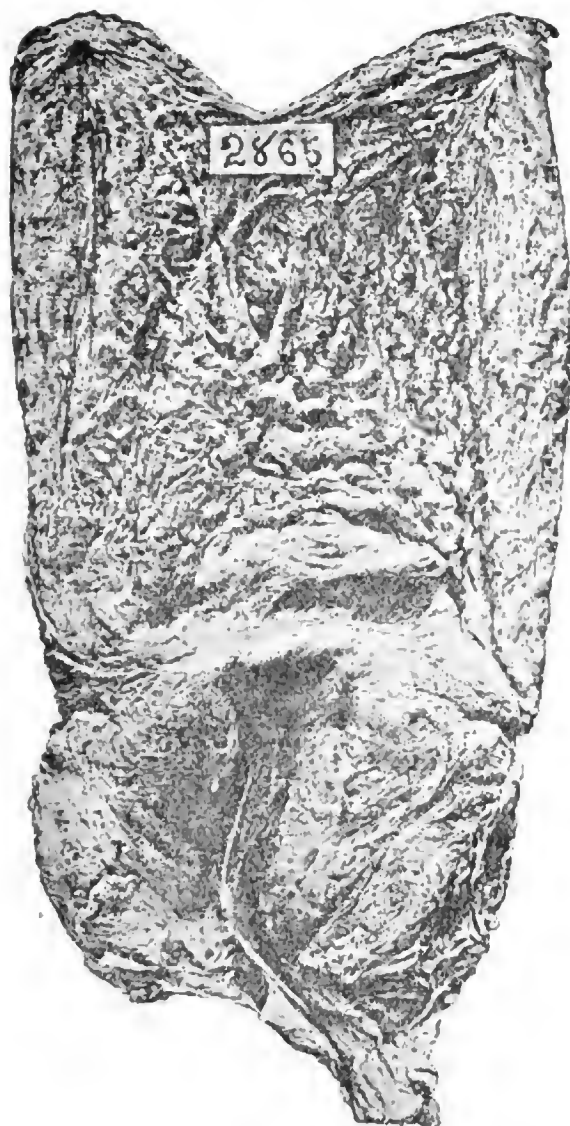


FIG. 11. SPECIMEN OF BILATERAL PROSTATIC ENLARGEMENT.

Three-fourths actual size. *Class 3.*

1. Perineal distance,  $2\frac{3}{4}$  inches.
2. Form of median obstruction, a bar between the lateral lobes.
3. A large bladder.

radical operations nineteen were relatively well for at least one year subsequently. Many patients passed from observation at a period too early to judge of the final result.

Before summing up the clinical evidence I wish to give a brief account of two cases in which I have performed radical operations, and describe a new instrument lately devised by me for the performance of some of the radical methods.

CASE I.—The patient was a man of 80 years of age; for three years he had been suffering from symptoms of urinary obstruction due to an enlarged prostate, latterly he had had several attacks of retention; in one of these catheterization resulted in a false passage in the prostatic urethra, rendering further introductions of the instrument almost impossible, and a cystitis supervened. An extensive bilateral hypertrophy of the prostate was present, and a bladder of large capacity. Through the kindness of Dr. E. H. Bradford, in whose service at the City Hospital he was, I was enabled to operate upon this patient. The supra-pubic method was chosen. The bladder opened without difficulty, after injecting it and raising it with the rectal balloon. A median enlargement of the prostate of crescentic form was found partially surrounding the bladder orifice, and obstructing the flow of urine. The more prominent portion of this was removed by a pair of cutting forceps, in three masses—in all about the size of an unshelled almond. No hæmorrhage took place. The bladder and outer wounds were left open and a double drainage tube inserted into the bladder; through an antiseptic dressing. These tubes carried off all the urine into a receptacle, and the dressings were scarcely moistened. The patient did excellently well for three days; on the fourth his temperature rose suddenly and finally reached 106°F; he became unconscious and died in twelve hours. The quantity of urine continued sufficient until his death, although it was of low specific gravity. A partial autopsy only was allowed, namely of the organs of the genito-urinary tract. The site of the removal of the growth was healing with healthy action. There was no suppuration in or about the wounds of the bladder or outer tissues, no peritonitis, no septic process to be found. The kidneys did not present sufficient organic change to account for death. The diagnosis of death probably from acute irritative urinary fever (so-called) was made.

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This specimen only differs from the last in having a large bladder, allowing the performance of the suprapubic method if desired, but as the median obstruction is within reach of a perineal prostatotomy that becomes the operation of choice.

CASE II.—The patient was a man, æt. 74; symptoms of urinary obstruction had been present for six years; catheterization necessary for three years; purulent and hæmorrhagic cystitis for three months, and for the same period he required to use the catheter every half hour day and night, and always with pain. Palliative treatment failed to

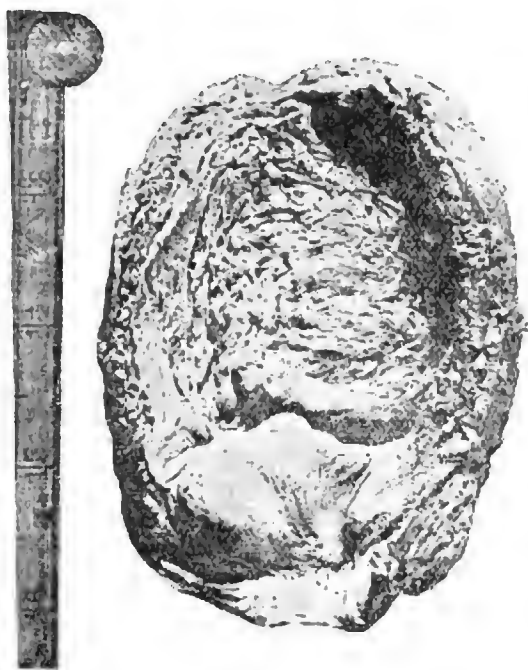


FIG. 12. SPECIMEN OF MEDIAN AND UNILATERAL PROSTATIC ENLARGEMENT.

Three-fourths actual size. *Class 4.*

1. Perineal distance,  $1\frac{3}{4}$  inches.
2. Irregular enlargement, the median and left lateral portion being hypertrophied and fused in one growth of moderate extent.
3. A small contracted bladder.

Owing to the small capacity of the bladder, it is unapproachable by the suprapubic route, but within easy reach of a perineal operation.

relieve. At the end of May last he was etherized, and I found that even under ether, the small rigid walled bladder would hold only two ounces of fluid. A perineal prostatotomy was decided upon in consequence. The "perineal distance" was so great (certainly  $3\frac{1}{2}$  inches) that it was only by strong pressure (counterpressure also being ex-



FIG. 13. SEPARATE PEDUNCUATED PROSTATIC TUMORS VIEWED FROM THE URETHRAL SIDE.

Bladder turned over out of sight. Three-fourths actual size. *Class 5.*

1. Perineal distance,  $2\frac{3}{4}$  inches.
2. Two growths, one from each side of the median portion, divided by a deep groove representing the continuation of the urethra, and two larger growths above, one from each lateral lobe.
3. A large distensible bladder.

The complicated form of the growths here make their eradication far easier from the suprapubic than from the perineal route.

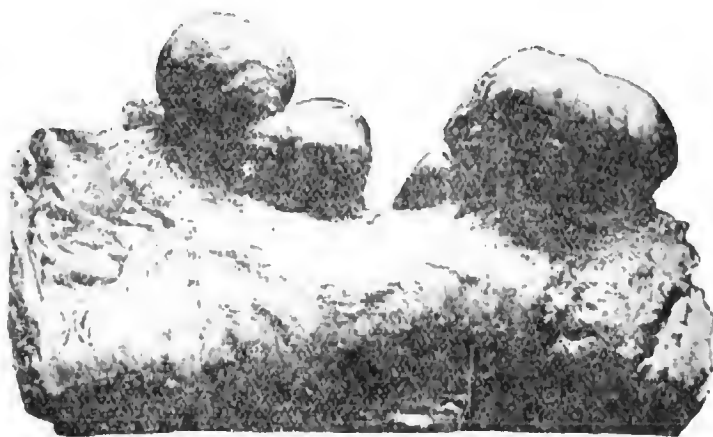


FIG. 14. THE SAME AS FIG. 13 VIEWED FROM THE VESICAL SIDE.



FIG. 15. A FORM OF PERINEAL DRAINAGE, LATELY DEvised BY THE AUTHOR TO USE AFTER PERINEAL SECTION FOR ANY PURPOSE, DEPICTED IN SITU AFTER A PERINEAL PROSTATECTOMY.

The following objects are accomplished in its construction. Its end occupies the lowest portion of the bladder and is smooth and round; its calibre is large; a large smooth-edged eye is placed close to its bladder end, leaving no cal de sac beyond it for the lodgment of dirt, and giving exit to large clots or debris.

The direction of the shaft is such as to correspond to that of the posterior urethra and to fit it, while its external portion is parallel with the bed's surface when the patient is lying on his back. This direction of the shaft of the tube was established by measurements with soft metal on twenty cadavers, and will be found to fit the average case. To accommodate itself to the varying lengths between the surface of the external wound and the bladder, the plate, by which the tube is held in place, can be pushed forward or back upon the shaft by firm pressure, but will stay where it is put. It should be passed into the bladder with its end pointing upward, and turned over after entering the viscus. The flow of fluid through it from the bladder is taken as a guide to fixing the plate. The tubes are of different calibres and every second number is furnished with a ridge just anterior to its eye, so that they can be converted into *canule a chemise*, if desired.

erted downward above the symphysis pubis), that the entering finger could reach with its tip the neck of the bladder. There it found the fortunate condition of a median enlargement of the form of a bar between the lateral lobes. This was divided centrally by a probe pointed bistoury. One of the drainage tubes already described was then inserted. This was worn for three weeks continuously, and at night ever since (six months to date). The patient made a rapid recovery; on the third day the blood disappeared from the urine; at the end of three weeks the urine was almost entirely clear, and the capacity of the bladder had increased to five ounces. He then went home.

The power of voluntary urination was not restored. During the day time he removes the perineal tube and goes about using a soft catheter to empty the bladder; passing it through the perineal opening about once in three hours. At night the stiff tube is resumed and he sleeps quietly all night. In this case the failure lies in the lack of restoration of the natural power to urinate; otherwise the change in the patient's condition is from one of extreme suffering and danger to entire comfort, usefulness and health.

The instrument I have to suggest is practically Mercier's prostatectatome converted into a galvano-cautery, the intention being to use it through the perineal or suprapubic route to remove central portions or the whole of the median enlargement piecemeal, as the case may require.

In form it is a short and broad bladed lithotrite, both blades being centrally cut away into large oval fenestra. Upon the inner and opposing surfaces of each blade, surrounding its fenestra, is fitted a corresponding surface of petrified wood. Two platinum wires (isolated) are conveyed through the handle and hollow center of the inner blade, at the distal end of which they emerge and unite above in the form of an oval loop corresponding to the form of the petrified wood upon which this loop rests. The obstructing portions of the prostate being caught between the two blades they are pressed or screwed together, while the wire is heated by the electric current from a connected battery, removing in this way a portion of the shape and size of the blades' fenestra. This process can

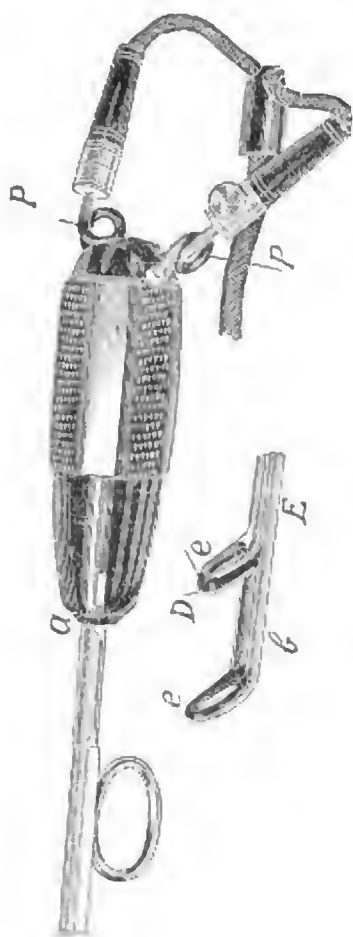


FIG. 16.—THE AUTHOR'S GALVANO CAUSTERY PROSTATECTATOME.

(a) Shaft, handle and connecting isolated wires.

(b) Distal or bladder end of instrument with its fenestrated blades.

(c,e) Rims of petrified wood of the shape and size of the fenestræ and fitted to them.

(D) Platinum wire loop resting upon c as an insulating surface, and passing in two separate and insulated wires through the hollow shaft E to connect with the battery wires P,P.

be repeated until the entire obstruction has been eradicated, if desired. I have not yet had the opportunity to use this instrument on the living subject, but have tried it on living tissues bathed in moisture in dogs, where its work is quick and radical and absolutely bloodless.

The advantages of a burning instrument are, of course, the avoidance of hemorrhage and lessening of the chances of septic absorption. The disadvantage is thought to be the greater cicatrix resulting. Whether in this situation and under these circumstances such a result is serious, we do not as yet know. The instrument is offered simply as one among other means of accomplishing the end in view.

#### CONCLUSIONS.

Returning now to the consideration of the clinical evidence let us see what can be learned from that, and then end by inferring so far as may be from the study of the anatomical and clinical data combined :

I. The mortality of the radical operations is certainly not higher than that of the palliative ones.



2. Of the palliative operations, that of suprapubic puncture with retained cannula, is by far the most dangerous. Its danger lies in the likelihood of urinary infiltration, along the sides of the retained cannula, into the prevesical space, giving rise to septic phlegmon and peritonitis. Its bladder end is likely to become stopped either by the bladder wall or clots or debris. It is an operation to be condemned *in toto*, especially since it has been shown by Rohmer and others that a free suprapubic cystotomy with a large single or better double drain is safer and more efficacious.

The perineal drainage is safer than the above.

The criticism against all palliative means is that they do not remove or modify the pathological condition.

The mortality of the radical methods, though less than half as great as that of the palliative ones, is still high. But it must be remembered that we are dealing with old men, and with advanced forms of the disease with all that that implies. And also, and upon this point *especial stress should be laid, many more cases die from unskilful catheterization, than from any or all the radical operations performed by competent surgeons*, and these cases are constantly being subjected to such catheterization. And this I claim is more dangerous than any of the operations we have considered—(except perhaps suprapubic puncture and retained cannula.) It is not an easy matter in some instances to insert a catheter over an obstructing prostate to relieve for instance, an attack of retention of urine. A soft rubber instrument failing, the medical practitioner generally resorts to a silver one, which it must be confessed is frequently in anything but an aseptic condition. An obstruction is encountered in the prostatic urethra, the patient is anxious, and in pain—a too vigorous shove is given to the catheter, and the mischief is done—a false passage made, urine collects in it and decomposes, no free drainage is present, and the patient not infrequently dies directly from the effects of this thrust. Pathologists who make many post mortem examinations will I feel confident corroborate this view. I only repeat, in this digression, the oft reiterated teaching of others to assert that a radical operation well done may be less dangerous than ordinary catheterization badly done.

3. The evidence that has been presented is sufficient in quantity, and in character to not only justify but to demand operative interference, under the conditions already laid down as indications for such a step.

4. As the radical operations are not more dangerous than the palliative ones, they are generally to be preferred at the onset because they accomplish more. The exception to this rule should be when the exhaustion of the patient is already very great. Then a palliative operation may be done at first, and if the patient rallies and is willing, a radical one later.

Mercier's and Bottini's operations from the meatus are applicable to only a limited number of cases, namely, those in which the median obstruction has the form of a bar between the lateral lobes, or is but moderately developed into the so-called third lobe. And this condition must have been determined beforehand (by sounds, etc.,) not an easy matter. Drainage is not provided for by these methods, and their advantages over the perineal methods in which the exact state of the parts can be made out by the finger—are not apparent. They may therefore practically be ruled out, so far as most cases are concerned at any rate.

This leaves the perineal and the suprapubic methods to be considered.

Practically every variety of the disease can be reached and successfully treated by one or the other of these two routes. *Anatomically, two-thirds of all cases are operable from the perineum. Clinically the perineal operations are the safest.*

The natural conclusion from these facts is it seems to me this, namely: In any given case, open the membranous urethra and explore. Twice out of three times the operation may be completed by this (the safest) means.

In the other third of the cases a long perineal distance or a long salient growth will make the suprapubic method necessary. When this is the case and if there be at the same time a bladder capable of sufficient distention to allow of the employment of the modern technique in this operation, it may be proceeded to *at once*, if the patient's condition is good—later, (meanwhile draining by the perineum) if it is bad.

The one combination which would make both operations

impossible would be of course, a perineal distance so long as to put the median growth beyond reach—and at the same time a contracted bladder of small capacity.

How often this combination occurs I cannot say. It happens not to have been present in any of the cases examined by me. When it does occur, one would be obliged to rest content with perineal drainage only.

The method of tunnelling a median enlargement from the perineum, as practiced successfully by Mr. Harrison, does not seem to offer any advantages over a prostatotomy or prostatectomy, is less exact, carries the risk of injuring the bladder wall, and does not offer so good or so permanent drainage. Mr. Harrison seems also to prefer now the suprapubic or perineal prostatotomies or prostatectomies.

In connection with the perineal operations Mr. Harrison has advocated prolonged drainage (8-11 weeks or more) and experience certainly demonstrates the value of this procedure.

The details of technique of the various operations have hardly been touched upon. Decided improvements in this direction may be looked for in the future, and at this moment the author has wished only to establish the claim for surgical interference in certain cases of the disease, and to lay down the lines in which such action should be taken.